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What is claimed is:

1. An image-forming device comprising:

5 a recording medium conveying unit that conveys a recording medium in a conveying direction, the recording medium having a first medium edge and a second medium edge in a widthwise direction orthogonal to the conveying direction;

a carriage having a print head that prints on the recording medium;

10 a detecting unit that performs a detecting operation;

a driving unit driving the carriage and the detecting unit to move in the widthwise direction while maintaining fixed a distance between the detecting unit and the carriage in the widthwise direction;

15 a carriage position detecting unit that detects a position of the carriage in the widthwise direction;

a mark printing unit that controls the print head to print on the recording medium a calibrating mark, the calibrating mark having a first mark edge and a second mark edge in the widthwise direction, the print head printing the first mark edge when the carriage is located on a first-mark-edge printing carriage position and printing the second mark edge when the carriage is located on a second-mark-edge printing carriage position, the first mark edge corresponding to the first medium edge and the second mark

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edge corresponding to the second medium edge;

5 a mark-edge-detection control unit that controls the driving unit to move the carriage and the detecting unit in the widthwise direction and controls the detecting unit to detect the first mark edge and the second mark edge, the mark-edge-detection control unit controlling the carriage position detecting unit to detect a position of the carriage when the detecting unit detects the first mark edge and when the detecting unit detects the second mark edge;

10 an offset setting unit that sets a first edge distance offset based on a first difference between the first-mark-edge printing carriage position and a position of the carriage that is detected when the detecting unit detects the first mark edge, and that sets a second edge distance  
15 offset based on a second difference between the second-mark-edge printing carriage position and a position of the carriage that is detected when the detecting unit detects the second mark edge;

20 a medium-edge-detection control unit that controls the driving unit to move the carriage and the detecting unit in the widthwise direction and controls the detecting unit to detect the first medium edge and the second medium edge, the medium-edge-detection control unit controlling the carriage position detecting unit to detect a position of the carriage  
25 when the detecting unit detects the first medium edge and

when the detecting unit detects the second medium edge;

an edge position determining unit that determines a first medium edge carriage position based on a position of the carriage detected when the detecting unit detects the first medium edge and the first edge distance offset, and  
5 that determines a second medium edge carriage position based on a position of the carriage detected when the detecting unit detects the second medium edge and the second edge distance offset; and

10 a print controlling unit that controls the print head to perform printing operations on the recording medium within a printable area that is defined between the first medium edge carriage position and the second medium edge carriage position, the carriage being located at the first  
15 medium edge when the carriage position detecting unit detects that the carriage is located at the first medium edge carriage position, the carriage being located at the second medium edge when the carriage position detecting unit detects that the carriage is located at the second medium  
20 edge carriage position.

2. An image-forming device according to Claim 1, wherein the detecting unit outputs a first-medium-edge detection result when detecting the first medium edge while moving in the widthwise direction, the detecting unit  
25 outputting a detection result that corresponds to the first-

medium-edge detection result when detecting the first mark edge while moving in the widthwise direction, and

5        wherein the detecting unit outputs a second-medium-edge detection result when detecting the second medium edge while moving in the widthwise direction, the detecting unit producing a detection result that corresponds to the second-medium-edge detection result when detecting the second mark edge while moving in the widthwise direction.

10        3. An image-forming device according to Claim 2, wherein the detecting unit comprises a reflection-type optical sensor whose sensor output depends on a reflectance of a target detection area defined by the reflection-type optical sensor, the target detection area moving in the widthwise direction when the reflection-type optical sensor  
15        moves in the widthwise direction, the reflection-type optical sensor detecting each of the first and second medium edges and the first and second mark edges based on change in the sensor output that is obtained while the reflection-type optical sensor is moving in the widthwise direction.

20        4. An image-forming device according to Claim 3, wherein the reflection-type optical sensor detects the first medium edge and the first mark edge when the sensor output changes in either one of a decreasing pattern and an increasing pattern, and wherein the reflection-type optical  
25        sensor detects the second medium edge and the second mark

edge when the sensor output changes in the other one of the decreasing pattern and the increasing pattern.

5        5. An image-forming device according to Claim 3, further comprising a reflecting member disposed in opposition to the reflection-type optical sensor within a conveying region through which the recording medium conveying unit conveys the recording medium and having a reflectance different from that of the recording medium, the target detection area being located on at least one of the  
10       reflecting member and the recording medium; and

the mark printing unit controls the print head to print the calibrating mark having a reflectance substantially equal to that of the reflecting member.

15       6. An image-forming device according to Claim 5, wherein the reflecting member has a color different from that of the recording medium; and

the mark printing unit prints the calibrating mark on the recording medium in a color substantially identical to the color of the reflecting member.

20       7. An image-forming device according to Claim 6, wherein each of the reflecting member and the calibrating mark is black in color.

8. An image-forming device according to Claim 2, wherein the offset setting unit includes:

25       a difference determining unit that determines a value

of the first difference for the first mark edge and a value of the second difference for the second mark edge at a plurality of different locations on the calibrating mark in the conveying direction; and

5        an offset determining unit that determines, as the first edge distance offset, an average value of the values of the first difference determined at the plurality of different locations, and that determines, as the second edge distance offset, an average of the values of the second difference determined at the plurality of different  
10        locations.

9. An image-forming device according to Claim 2, wherein a positional relationship of the first mark edge and the second mark edge in the widthwise direction is opposite  
15        to a positional relationship of the first medium edge and the second medium edge in the widthwise direction.

10. An image-forming device according to Claim 9, wherein the mark-edge-detection control unit controls the carriage and the detecting unit to move in a right-to-  
20        left direction along the widthwise direction,

wherein the medium-edge-detection control unit controls the carriage and the detecting unit to move in the right-to-left direction along the widthwise direction,

wherein the first medium edge and the second medium  
25        edge are right and left edges of the recording medium,

respectively, and

wherein the first mark edge and the second mark edge are left and right edges of the calibrating mark, respectively.

5           11. An image-forming device according to Claim 2, wherein the mark printing unit controls the print head to print a first calibrating mark having the first mark edge and a second calibrating mark having the second mark edge.

10           12. An image-forming device according to Claim 11, wherein the offset setting unit includes:

          a first difference determining unit that determines a value of the first difference for the first mark edge of the first calibrating mark at a plurality of different locations in the conveying direction;

15           a second difference determining unit that determines a value of the second difference for the second mark edge of the second calibrating mark at a plurality of different locations in the conveying direction; and

20           an offset determining unit that determines, as the first edge distance offset, an average of the values of the first difference determined at the plurality of different locations, and that determines, as the second edge distance offset, an average of the values of the second difference determined at the plurality of different locations.

25           13. An image-forming device according to Claim 11,



wherein the mark printing unit controls the print head to print the first mark edge of the first calibrating mark and the second mark edge of the second calibrating mark substantially at the same location in the widthwise direction on the recording medium.

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14. An image-forming device comprising:

a recording medium conveying unit that conveys a recording medium in a conveying direction;

10 a carriage having a print head that prints on the recording medium and having a detecting unit that performs a detecting operation, the print head and the detecting unit being distant from each other in a widthwise direction orthogonal to the conveying direction;

15 a driving unit driving the carriage to move in the widthwise direction;

a carriage position detecting unit that detects a position of the carriage in the widthwise direction;

20 a first recording-medium convey control unit controlling the recording medium conveying unit to convey a first recording-medium in the conveying direction;

25 a mark printing unit that controls the print head to print on the recording medium a calibrating mark, the calibrating mark having a first mark edge and a second mark edge in the widthwise direction, the print head printing the first mark edge when the carriage is located on a first-

mark-edge printing carriage position and printing the second mark edge when the carriage is located on a second-mark-edge printing carriage position;

5 a mark-edge-detection control unit that controls the driving unit to move the carriage in the widthwise direction and controls the detecting unit to detect the first mark edge and the second mark edge, the detecting unit outputting a first-mark-edge detection result when detecting the first mark edge while moving in the widthwise direction and  
10 outputting a second-mark-edge detection result when detecting the second mark edge while moving in the widthwise direction, the mark-edge-detection control unit controlling the carriage position detecting unit to detect a position of the carriage when the detecting unit detects the first mark  
15 edge and when the detecting unit detects the second mark edge;

an offset setting unit that sets a first edge distance offset based on a first difference between the first-mark-edge printing carriage position and a position of the  
20 carriage that is detected when the detecting unit detects the first mark edge, and that sets a second edge distance offset based on a second difference between the second-mark-edge printing carriage position and a position of the carriage that is detected when the detecting unit detects  
25 the second mark edge;

a second recording-medium convey control unit controlling the recording medium conveying unit to convey a second recording-medium in the conveying direction, the second recording medium having a first medium edge and a second medium edge in the widthwise direction;

a medium-edge-detection control unit that controls the driving unit to move the carriage in the widthwise direction and controls the detecting unit to detect the first medium edge and the second medium edge, the detecting unit outputting a detection result that corresponds to the first-mark-edge detection result when detecting the first medium edge while moving in the widthwise direction and outputting a detection result that corresponds to the second-mark-edge detection result when detecting the second medium edge while moving in the widthwise direction, the medium-edge-detection control unit controlling the carriage position detecting unit to detect a position of the carriage when the detecting unit detects the first medium edge and when the detecting unit detects the second medium edge;

an edge position determining unit that determines a first medium edge carriage position based on a position of the carriage detected when the detecting unit detects the first medium edge and the first edge distance offset, and that determines a second medium edge carriage position based on a position of the carriage detected when the detecting

unit detects the second medium edge and the second edge distance offset; and

5 a print controlling unit that controls the print head to perform printing operations on the second recording medium within a printable area that is defined between the first medium edge carriage position and the second medium edge carriage position, the carriage being located at the first medium edge when the carriage position detecting unit detects that the carriage is located at the first medium  
10 edge carriage position, the carriage being located at the second medium edge when the carriage position detecting unit detects that the carriage is located at the second medium edge carriage position.

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